

Psychiatric Disorders in Foster Home Reared Children of Schizophrenic Mothers*

By LEONARD L. HESTON

INTRODUCTION

The place of genetic factors in the aetiology of schizophrenia remains disputed. Several surveys have demonstrated a significantly higher incidence of the disorder in relatives of schizophrenic persons as compared to the general population. Furthermore, the closer the relationship, the higher the incidence of schizophrenia. The studies of Kallmann (1938) and Slater (1953) are especially significant and the research in this area has been thoroughly reviewed by Alanen (1958).

Although the evidence for a primarily genetic aetiology of schizophrenia is impressive, an alternative explanation—that schizophrenia is produced by a distorted family environment—has not been excluded. A close relative who is schizophrenic can be presumed to produce a distorted interpersonal environment and the closer the relationship the greater the distortion.

This study tests the genetic contribution to schizophrenia by separating the effects of an environment made "schizophrenogenic" by the ambivalence and thinking disorder of a schizophrenic parent from the effects of genes from such a parent. This is done by comparing a group of adults born to schizophrenic mothers where mother and child were permanently separated after the first two postpartum weeks with a group of control subjects.

SELECTION OF SUBJECTS

The Experimental subjects were born between 1915 and 1945 to schizophrenic mothers confined to an Oregon State psychiatric hospital. Most of the subjects were born in the psychiatric hospital; however, hospital authorities encour-

aged confinement in a neighbouring general hospital whenever possible, in which case the children were delivered during brief furloughs. All apparently normal children born of such mothers during the above time span were included in the study if the mother's hospital record (1) specified a diagnosis of schizophrenia, dementia praecox, or psychosis; (2) contained sufficient descriptions of a thinking disorder or bizarre regressed behaviour to substantiate the diagnosis; (3) recorded a negative serologic test for syphilis and contained no evidence of coincident disease with known psychiatric manifestations; and (4) contained presumptive evidence that mother and child had been separated from birth. Such evidence typically consisted of a statement that the mother had yielded the child for adoption, a note that the father was divorcing the mother, the continued hospitalization of the mother for several years, or the death of the mother. In practice these requirements meant that the mothers as a group were biased in the direction of severe, chronic disease. No attempt was made to assess the psychiatric status of the father; however, none were known to be hospital patients. The 74 children ascertained as above were retained in the study if subsequent record searches or interviews confirmed that the child had had no contact with its natural mother and never lived with maternal relatives. (The latter restriction was intended to preclude significant exposure to the environment which might have produced the mother's schizophrenia.)

All of the children were discharged from the State hospital within three days of birth (in accordance with a strictly applied hospital policy) to the care of family members or to foundling homes. The records of the child care institutions made it possible to follow many

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subjects through their early life, including, for some, adoption. The early life of those subjects discharged to relatives was less completely known, although considerable information was developed by methods to be described.

Sixteen subjects were dropped because of information found in foundling home records; 6 children, 4 males and 2 females, died in early infancy. Ten others were discarded, 8 because of contact with their natural mother or maternal relatives, one because of multiple gastrointestinal anomalies, and one because no control subject whose history matched the bizarre series of events that complicated the Experimental subject's early life could be found. The remaining 58 subjects comprise the final Experimental group.

A like number of control subjects, apparently normal at birth, were selected from the records of the same foundling homes that received some of the Experimental subjects. The control subjects were matched for sex, type of eventual placement (adoptive, foster family, or institutional), and for length of time in child care institutions to within ± 10 per cent. up to 5 years. (Oregon State law prohibited keeping a child in an institution more than five years. Subjects in institutions up to this maximum were counted as "institutionalized" regardless of final placement.) Control subjects for the Experimental children who went to foundling homes were selected as follows: When the record of an Experimental subject was located, the admission next preceding in time was checked, then the next subsequent, then the second preceding and so on, until a child admitted to the home within a few days of birth and meeting the above criteria was found. Those Experimental subjects who were never in child care institutions were

matched with children who had spent less than three months in a foundling home. The above method of selection was used with the record search beginning with an Experimental child's year of birth. The above restrictions regarding maternal contacts were applied to the control group. Oregon State psychiatric hospital records were searched for the names of the natural parents (where known) of the control subjects. In two cases a psychiatric hospital record was located and the children of these persons were replaced by others. All of the children went to families in which both parental figures were present.

Exact matching was complicated by the subsequent admission of several subjects to other child care institutions and by changes of foster or even adoptive homes. However, these disruptions occurred with equal frequency and intensity in the two groups and are considered random.

Table I gives the sex distribution of the subjects and the causes of further losses. Fifteen of the 74 Experimental subjects died before achieving school age. This rate is higher than that experienced by the general population for the ages and years involved, but not significantly so.

FOLLOW-UP METHOD

Starting in 1964, it proved possible to locate or account for all of the original subjects except five persons, all females. During this phase of the research, considerable background information of psychiatric import was developed. The records of all subjects known to police agencies and to the Veterans' Administration were examined. Retail credit reports were

TABLE I

	Experimental		Control	
	Male	Female	Male	Female
Number	33	25	33	25
Died, infancy or childhood	3	6		5
Lost to follow-up		2		3
Final Groups	30	17	33	17

obtained for most subjects. School records, civil and criminal court actions, and newspaper files were reviewed. The records of all public psychiatric hospitals in the three West Coast States were screened for the names of the subjects and the records located were reviewed. Enquiries were directed to psychiatric facilities serving other areas where subjects were living, and to probation departments, private physicians, and various social service agencies with which the subjects were involved. Finally, relatives, friends and employers of most subjects were contacted.

In addition to information obtained from the above sources, for most subjects the psychiatric assessment included a personal interview, a Minnesota Multiphasic Personality Inventory (MMPI), an I.Q. test score, the social class of the subject's first home, and the subject's current social class. As the subjects were located, they were contacted by letter and asked to participate in a personal interview. The interview was standardized, although all promising leads were followed, and was structured as a general medical and environmental questionnaire which explored all important psychosocial dimensions in considerable depth. Nearly all of the interviews were conducted in the homes of the subjects, which added to the range of possible observations. The short form of the MMPI was given after the interview. The results of an I.Q. test were available from school or other records for nearly all subjects. If a test score was not available, the Information, Similarities, and Vocabulary subtests of the Wechsler Adult Intelligence Scale (WAIS) was administered and the I.Q. derived from the results. Two social class values were assigned according to the occupational classification system of Hollingshead (1958). One value was based on the occupation of the father or surrogate father of the subject's first family at the time of placement, and a second on the subject's present occupational status or, for married females, the occupation of the husband. The social class values move from 1 to 7 with decreasing social status.

All of the investigations and interviews were conducted by the author in 14 States and in Canada.

EVALUATION OF SUBJECTS

The dossier compiled on each subject, excluding genetic and institutional information, was evaluated blindly and independently by two psychiatrists. A third evaluation was made by the author. Two evaluative measures were used. A numerical score moving from 100 to 0 with increasing psycho-social disability was assigned for each subject. The scoring was based on the landmarks of the Menninger Mental Health-Sickness Rating Scale (MHSRS) (Luborsky, 1962). Where indicated, the raters also assigned a psychiatric diagnosis from the American Psychiatric Association nomenclature.

Evaluations of 97 persons were done. Seventy-two subjects were interviewed. Of the remaining 25 persons, six refused the interview (7.6 per cent. of those asked to participate), eight were deceased, seven are inaccessible (active in Armed Forces, abroad, etc.), and four were not approached because of risk of exposure of the subject's adoption. It did not seem reasonable to drop all of these 25 persons from the study, since considerable information was available for most of them. For instance, one man was killed in prison after intermittently spending most of his life there. His behavioural and social record was available in prison records plus the results of recent psychological evaluations. A man who refused the interview was a known, overt, practising homosexual who had a recent felony conviction for selling narcotics. All persons in the Armed Forces were known through letters from their Commanding Officers or medical officers to have been serving honourably without psychiatric or serious behavioural problems. One 21-year-old man, the least known of any of the subjects, had been in Europe for the preceding 18 months in an uncertain capacity. He is known to have graduated from high school and to have no adverse behavioural record. In a conference the raters agreed that it would be misleading to discard any cases, and that all subjects should be rated by forced choice.

The MHSRS proved highly reliable as a measure of degree of incapacity. The Intraclass Correlation Coefficient between the scores assigned by the respective raters was 0.94,

indicating a high degree of accuracy. As expected, several differences arose in the assignment of specific diagnoses. In disputed cases a fourth psychiatrist was asked for an opinion and differences were discussed in conference. The only differences not easily resolved involved distinctions such as obsessive-compulsive neurosis versus compulsive personality or mixed neurosis versus emotionally unstable personality. All differences were within three diagnostic categories: psychoneurotic disorders, personality trait or personality pattern disturbances. The raters decided to merge these categories into one: "neurotic personality disorder". This category included all persons with MHSRS scores less than 75—the point on the scale where psychiatric symptoms become troublesome—who received various combinations of the above three diagnoses. In this way, complete agreement on four diagnoses was achieved: schizophrenia, mental deficiency, sociopathic personality, and neurotic personality disorder.

One mental defective was also diagnosed schizophrenic and another sociopathic. Only one diagnosis was made for all other subjects.

RESULTS

Psychiatric disability was heavily concentrated in the Experimental group. Table II summarizes the results.

The MHSRS scores assess the cumulative psycho-social disability in the two groups. The difference is highly significant with the Experimental group, the more disabled by this measure. However, the difference is attributable to the low scores achieved by about one-half (26/47) of the Experimental subjects rather than a general lowering of all scores.

The diagnosis of schizophrenia was based on generally accepted standards. In addition to the unanimous opinion of the three raters, all subjects were similarly diagnosed in psychiatric hospitals. One female and four males com-

TABLE II

	Control	Experimental	Exact Probability
Number	50	47	
Male	33	30	
Age, Mean	36.3	35.8	
Adopted	19	22	
MHSRS, Mean (Total group mean = 72.8, S.D. = 18.4)	80.1	65.2	0.0006
Schizophrenia (Morbidity Risk = 16.6%)	0	5	0.024
Mental Deficiency (I.Q. < 70)	0	4	0.052
Sociopathic Personality	2	9	0.017
Neurotic Personality Disorder	7	13	0.052
Persons spending > 1 year in Penal or Psychiatric Institution	2	11	0.006
Total years Institutionalized	15	112	
Felons	2	7	0.054
Armed Forces, Number Serving	17	21	
Armed Forces, Number Discharges, Psychiatric or Behavioural	1	8	0.021
Social Group, First Home, Mean	4.2	4.5	
Social Group, Present, Mean	4.7	5.4	
I.Q., Mean	103.7	94.0	
Years School, Mean	12.4	11.6	
Children, Total	84	71	
Divorces, Total	7	6	
Never Married, > 30 Years Age	4	9	

One mental defective was also schizophrenic.

Another was sociopathic.

Considerable duplication occurs in the entries below Neurotic Personality Disorder.

* Fisher Exact Probability Test.

prised the schizophrenic group. Three were chronic deteriorated patients who had been hospitalized for several years. The other two had been hospitalized and were taking anti-psychotic drugs. One of the latter persons was also mentally deficient: a brief history of this person follows.

A farm labourer, now 36 years old, was in an institution for mentally retarded children from age 6-16. Several I.Q. tests averaged 62. He was discharged to a family farm, where he worked for the next 16 years. Before his hospitalization at age 32 he was described as a peculiar but harmless person who was interested only in his bank account: he saved \$5,500 out of a salary averaging \$900 per year. Following a windstorm that did major damage to the farm where he worked he appeared increasingly agitated. Two days later he threatened his employer with a knife and accused him of trying to poison him. A court committed him to a psychiatric hospital. When admitted, he talked to imaginary persons and assumed a posture of prayer for long periods. His responses to questions were incoherent or irrelevant. The hospital diagnosis was schizophrenic reaction. He was treated with phenothiazine drugs, became increasingly rational, and was discharged within a month. After discharge he returned to the same farm, but was less efficient in his work and spent long periods sitting and staring blankly. He has been followed as an out-patient since discharge, has taken phenothiazine drugs continuously, and anti-depressants occasionally. This man exhibited almost no facial expression. His responses to questions, though relevant, were given after a long and variable latency.

The age-corrected rate for schizophrenia is 16.6 per cent., a finding consistent with Kallmann's 16.4 per cent. (Weinberg's short method, age of risk 15-45 years). Hoffman (1921) and Oppler (1932) reported rates of from 7 to 10.8 per cent. of schizophrenia in children of schizophrenics. No relationship between the severity and sub-type of the disease in the mother-child pairs was evident.

Mental deficiency was diagnosed when a subject's I.Q. was consistently less than 70. All of these persons were in homes for mental defectives at some time during their life and one was continuously institutionalized. His I.Q. was 35. The other mentally deficient subjects had I.Q.s between 50 and 65. No history of CNS disease or trauma of possible causal importance was obtained for any of these subjects. The mothers of the mentally defective subjects were not different from the other mothers and none were mentally defective.

Three behavioural traits were found almost exclusively within the Experimental group. These were: (1) significant musical ability, 7 persons; (2) expression of unusually strong religious feelings, 6 persons; and (3) problem drinking, 8 persons.

The results with respect to the effects of institutional care, social group, and type of placement will be discussed in a later paper. None of these factors had measurable effects on the outcome.

DISCUSSION

The results of this study support a genetic aetiology of schizophrenia. Schizophrenia was found only in the offspring of schizophrenic mothers. The probability of this segregation being effected by chance is less than 0.025. Furthermore, about one-half of the Experimental group exhibited major psycho-social disability. The bulk of these persons had disorders other than schizophrenia which were nearly as malignant in effect as schizophrenia itself. An illustration is provided by the 8 of 21 Experimental males who received psychiatric or behavioural discharges from the armed services. If three subjects who were rejected for service for the same reasons are added, the ratio becomes 11 : 24, or essentially 1 : 2. Only three of these 11 subjects were schizophrenic and one schizophrenic served honourably. Kallmann's (1938) rate for first degree relatives and Slater's (1953) for dizygotic twins of schizophrenic persons who developed significant psycho-social disability not limited to schizophrenia are slightly lower, though in the same range, as those found in the present study.

The association of mental deficiency with schizophrenia has been reported by Hallgren and Sjögren (1959) who noted an incidence of low-grade mental deficiency (I.Q. < 50-55) in schizophrenic subjects of about 10.5 per cent. Kallmann (1938) found from 5-10 per cent. mental defectives among his descendants of schizophrenic persons, but did not consider the finding significant. The association of mental deficiency with schizophrenia—if such an association exists—remains uncertain.

Two sub-groups of persons within the impaired one-half of Experimental subjects exhibited roughly delineable symptom-behaviour complexes other than schizophrenia or mental deficiency. The personalities of the persons composing these groups are described in aggregate below.

The first group is composed of subjects who fit the older diagnostic category, "schizoid psychopath". This term was used by Kallmann (1938) to describe a significant sub-group of his relatives of schizophrenic persons. Eight males from the present study fall into this group, all of whom received a diagnosis of sociopathic personality. These persons are distinguished by anti-social behaviour of an impulsive, illogical nature. Multiple arrests for assault, battery, poorly planned impulsive thefts dot their police records. Two were homosexual, four alcoholic, and one person, also homosexual, was a narcotics addict. These subjects tended to live alone—only one was married—in deteriorated hotels and rooming houses in large cities, and locating them would have been impossible without the co-operation of the police. They worked at irregular casual jobs such as dishwasher, race-track tout, parking attendants. When interviewed they did not acknowledge or exhibit evidence of anxiety. Usually secretive about their own life and circumstances, they expressed very definite though general opinions regarding social and political ills. In spite of their suggestive life histories, no evidence of schizophrenia was elicited in interviews. No similar personalities were found among the control subjects.

A second sub-group was characterized by emotional lability and may correspond to the neurotic sibs of schizophrenics described by Alanen (1963). Six females and two males from the Experimental group as opposed to two control subjects were in this category. These persons complained of anxiety or panic attacks, hyper-irritability, and depression. The most frequent complaint was panic when in groups of people as in church or at parties, which was so profoundly uncomfortable that the subject was forced to remove himself abruptly. Most subjects described their problems as occurring episodically; a situation that they might tolerate

with ease on one occasion was intolerable on another. The woman reported life-long difficulty with menses, especially hyper-irritability or crying spells, and depressions coincident with pregnancy. These subjects described themselves as "moody", stating that they usually could not relate their mood swings to temporal events. Four such subjects referred to their strong religious beliefs much more frequently than other respondents. Psychophysiological gastrointestinal symptoms were prominent in five subjects. The most frequent diagnoses advanced by the raters were emotionally unstable personality and cyclothymic personality, with neurosis a strong third.

Of the 9 persons in the control group who were seriously disabled, 2 were professional criminals, careful and methodical in their work, 2 were very similar to the emotionally labile group described above, one was a compulsive phobia-ridden neurotic, and 4 were inadequate or passive-aggressive personalities.

The 21 Experimental subjects who exhibited no significant psycho-social impairment were not only successful adults but in comparison to the control group were more spontaneous when interviewed and had more colourful life histories. They held the more creative jobs: musician, teacher, home-designer; and followed the more imaginative hobbies: oil painting, music, antique aircraft. Within the Experimental group there was much more variability of personality and behaviour in all social dimensions.

SUMMARY

This report compares the psycho-social adjustment of 47 adults born to schizophrenic mothers with 50 control adults, where all subjects had been separated from their natural mothers from the first few days of life. The comparison is based on a review of school, police, veterans, and hospital, among several other records, plus a personal interview and MMPI which were administered to 72 subjects. An I.Q. and social class determination were also available. Three psychiatrists independently rated the subjects.

The results were:

(1) Schizophrenic and sociopathic personality disorders were found in those persons born to schizophrenic persons in an excess exceeding chance expectation at the 0.05 level of probability. Five of 47 persons born to schizophrenic mothers were schizophrenic. No cases of schizophrenia were found in 50 control subjects.

(2) Several other comparisons, such as persons given other psychiatric diagnoses, felons, and persons discharged from the Armed Forces for psychiatric or behavioural reasons, demonstrated a significant excess of psycho-social disability in about one-half of the persons born to schizophrenic mothers.

(3) The remaining one-half of the persons born to schizophrenic mothers were notably successful adults. They possessed artistic talents and demonstrated imaginative adaptations to life which were uncommon in the control group.

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